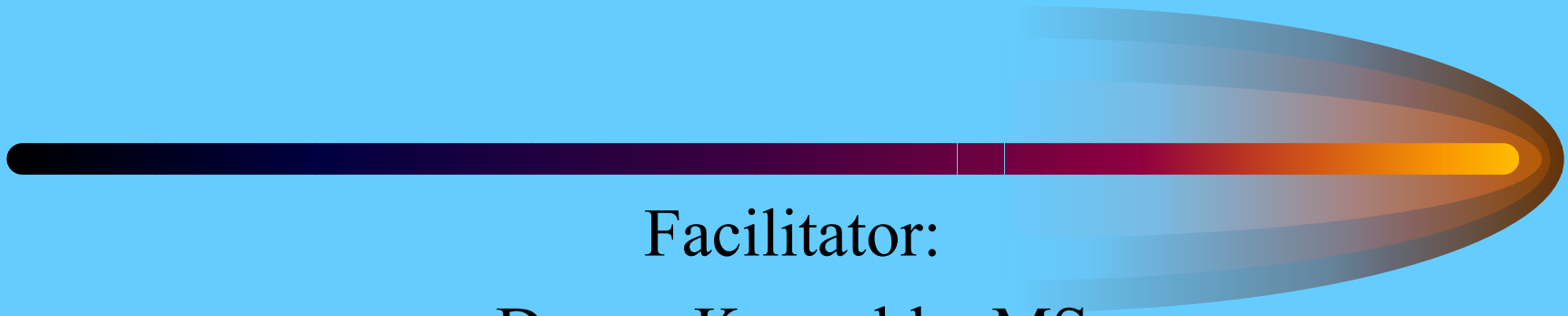
Mathematics Standard Articulated by Grade Level Institute



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Rationale for the Articulated Standards

- No Child Left Behind compliance issues
- Effective practice to realign with the latest research and student data

NCLB Professional Development and Teacher Quality

- Advance teacher understanding of:
  - Effective practices
  - State standards alignment
  - Student progress monitoring - use of data and assessments to monitor instruction
  - Opportunity to Learn (OTL) - provide teachers with skills to implement OTL for all students with standards-based instruction
- Recruit and retain “Highly Qualified” teachers

National Council of Teachers of Mathematics

- *Principles and Standards for School Mathematics, 2000*
- *Professional Development Standards*
- *Assessment Standards*
- *Navigation Series K-12*
- *NCTM is recognized as scientifically researched*
- *Lessons Learned through Research*

NCTM Process Standards

- Communication
- Connections
- Problem Solving
- Reasoning and Proof
- Representations

Communication

- Organize and consolidate thinking
- Express thinking in a clear and coherent way
- Analyze and evaluate others orally
- Use mathematical vocabulary
- Additional practices
  - Use inquiry and questioning
  - Use “argument” and justification
  - Use discourse to deepen understanding of concepts
  - Use prior knowledge
  - Use information in context

Connections

- Recognize the connections of mathematical ideas
- Understand the interconnections
- Build and synthesize the “whole”
- Recognize and apply mathematics in various contexts
- Spiral through and make connections within the five strands of mathematics

Problem Solving

- Build new mathematical knowledge
- Solve mathematical problems in many contexts
- Use a variety of strategies
- Utilize prior knowledge and prior use of strategies
- Monitor and reflect on the processes

Reasoning and Proof

- Use the fundamentals of mathematics
- Make and investigate conjectures
- Develop and evaluate arguments and proofs
- Select various reasoning and methods of proof

Representations

- Create and use data displays, models, tables, graphs, pictures or charts to organize and record
- Select, apply and translate to solve problems
- Model and interpret physical, social and mathematical phenomena

CPR of Mathematics

The NCTM Process Standards breathe "life" into the mathematics classroom.

Process Provides for the Elements of Motivation:

*A*ppropriate Level of Concern

*S*uccess

*K*nowledge of Results/Feedback

*I*nterest

*F*eeling Tone

Effective Practices NCTM Professional Standards

- Environment and climate of classroom
- Worthwhile mathematical tasks
- Teacher's role in discourse
- Student's role in discourse
- Tools for discourse
- Analysis of teaching and learning

Treasure Hunting for Success

- Why were the standards articulated by grade level?
- What are the five NCTM process standards?
- What part do the process standards have in the articulated standards?
- What are the five strands of Arizona mathematics?
- Which strand is unique?
- Why is the spiraling of mathematical skills important?
- What concept in mathematics can be used to explain nature?
- Find strand 3 of fourth grade, concept 1, then find how many performance objectives are listed for this grade level concept.

Academic Standards Transition

Standards Articulated by Grade Level

- ADE Curricular/Instructional Declaration (not 2004)
- AIMS currently assesses the original standards, benchmarked at grades 3,5,8, & high school through 2004
- AIMS is currently field-testing items from the Articulated Standards for inclusion in AIMS 2005
- Reading and Mathematics Standards Articulated by Grade Level will be assessed in 2005
- NCLB accountability in 2006

Let's Take a Serious Look

- Process
- Rationale
- Glossary
- Crosswalk
- Format

Taking a Closer Look at Grade Levels

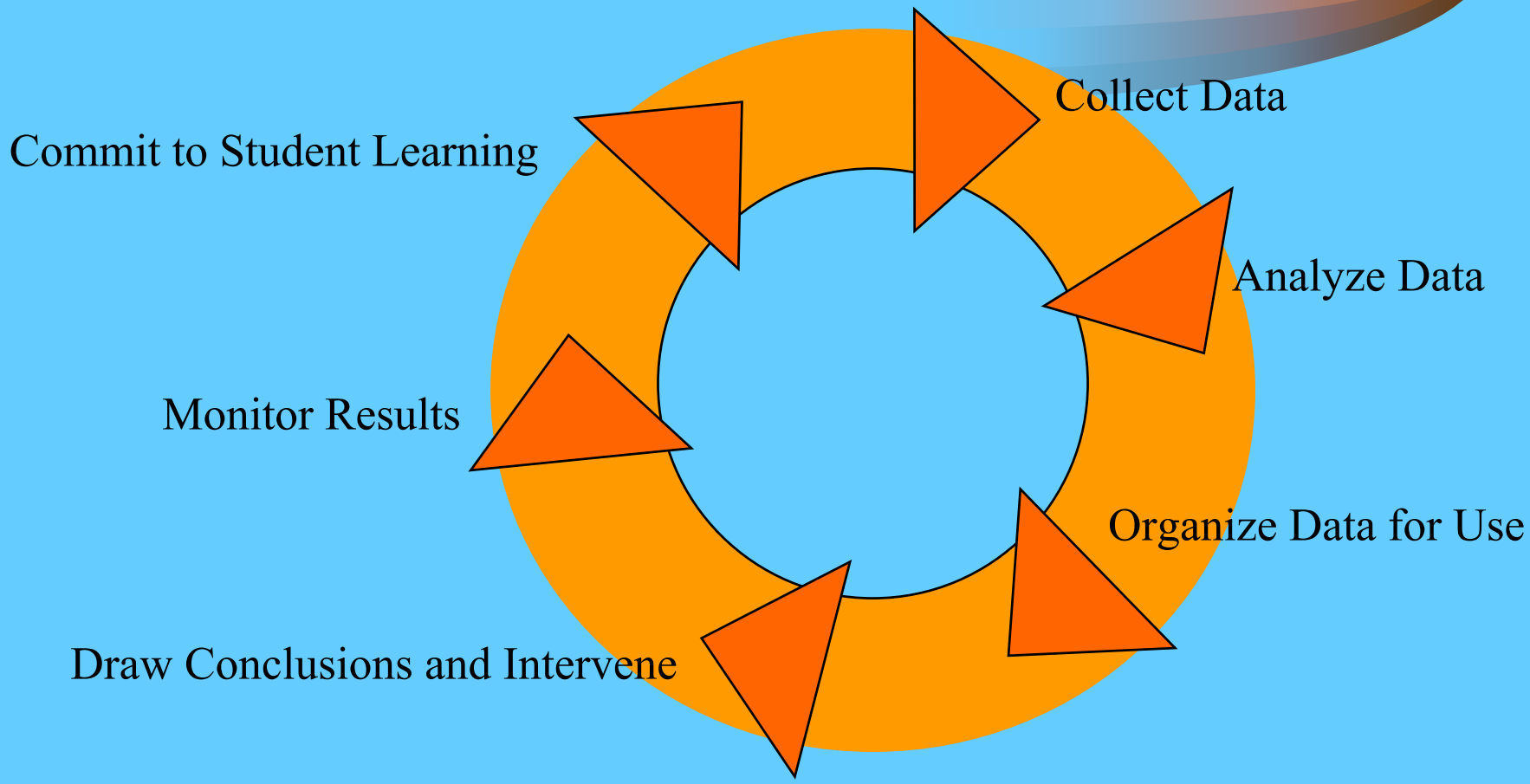
Please examine your assigned Mathematics Strand (Number Sense, Geometry and Measurement)

- First, examine the strand and prioritize major topics or concepts that are taught in that strand
- Second, look for specific learnings that are maintained in that strand
- Record on a poster and post
- Choose a spokesperson to share your findings

Guiding Principles of Data Use

- Focus is on student learning
- Systemic approach used to improve learning
- No classroom change, NO change
- Equity is center stage
- Critical supports make or break reform
- Authentic change begins with the use of data
- Change is collaborative

Data Driven Alignment



Collect Data

Take a moment and reflect on the type of data you currently use to make decisions about student learning.

Analyze and Organize Data

What are the strengths and weaknesses?

What performance gaps exist?

Are performance gaps linked to a particular population?

What effect does Opportunity to Learn have on particular populations?

Draw Conclusions and Intervene

What conclusions can we draw about:

- Curriculum
- Instruction
- Assessment
- Professional Development
- Leadership Capacity
- Fiscal Management

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Monitor the Results

- Use standardized assessment results to find trends
- Adjust curriculum, professional development
- Use classroom diagnostic assessment to task analyze learning needs
- Adjust instruction accordingly

ADE as your Partner

- Needs Assessment Survey
- Vigilant Data Examination and Reporting
- Az Regional Support Center Support
- Standards Academies in Mathematics
- Mathematics Instructional Resource Guides
- Future Professional Development Opportunities
- Web Page to Link Resources and Tools

Reflections/ Evaluations

Please complete your evaluation for the day and place on the table.

Thank you for your participation!